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Alphabet Soup:
Command And Control Of Tactical Air Sorties

A Monograph
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ABSTRACT

ALPHABET SOUP: COMMAND AND CONTROL OF TACTICAL AIR SORTIES by MAJ Richard H. Lang II, USAF, 52 pages.

This monograph discusses command and control of tactical airpower specifically and command and control of any assets capable of interdiction in general. It seeks to answer the question of how to best control these assets in the future.

The monograph traces the development of command and control systems for tactical airpower beginning with World War I and continues through World War II, Korea and Vietnam. It then analyzes the three systems in existance today, the Tactical Air Control System (TACS), and the modified systems in use in NATO and Korea.

The monograph then borrows concepts from the AirLand Operations concept as a framework of operations used by a future joint force commander. It uses this scenario to develop a notional command structure for the joint force and establish responsibilities for phases of the mission.

Table of Contents

A Bad Day to be a Fighter Pilot

It's been a long day already. It's the fifth day of the war. During your 0400 intelligence briefing, you learned the enemy has helicopters armed with air to air missiles. Your first two missions today were routine. Takeoff and rendezvous with the strike package for this mission was normal. As soon as you came off the tanker, the enemy's jamming started. You have not understood a radio call since. No problem, the Air Tasking Order (ATO) has your flight of F-15s leading the strike package into the target area. Everybody in front of you is a bad guy. A quick glance at the radar shows a contact on the nose at 30 miles. You look outside and recognize the terrain feature that marks the Fire Support Coordination Line (FSCL). You also notice a white smoke trail coming toward you. BREAK!! 9 G's drains the blood from your head. The missile overshoots. Turn back to course. Contacts are now 20 miles on the nose. They're low doing about a hundred knots. Must be a helicopter. ATO says no friendly aircraft are in the area. Check his IFF.* Target is not squawking the friendly code from the ATO. You remember the warning by your intelligence section about helicopters with air to air missiles. You decide to engage. Fox 1!** You watch the missile guide to the target and destroy it. As you pass over the wreckage, you realize in horror that the wreckage was clearly

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* Identification friend or foe. An electronic device which determines if a target is friendly or enemy.

** The F-15 fired a radar guided missile at the target.

that of a US Army AH-64 Apache helicopter. How did he get there and what did you do wrong are questions that immediately jump into your mind. As you egress the area shaken and confused, you inadvertently fly over an enemy ammo dump. Suddenly, the ground erupts in explosions and secondaries from a US Army rocket attack. Debris penetrates your aircraft and you lose flight control. As your chute carries you to a waiting enemy, you realize you now have a long time to reflect on Air Force and Army coordination problems.

Far fetched? Maybe. Impossible? Not a chance. With the increasing proliferation of deep attack assets each service owns, command and control of those assets are increasingly complex and critical to the successful deep battle fight. This monograph will analyze the three existing command and control systems and attempt to determine how best to control tactical air sorties in the future.

The three systems to discuss are the United States Air Force Tactical Air Control System (TACS), NATO's Offensive Air Support System (OAS), and Korea's Combined Forces Command Deep Battle Synchronization Doctrine. The discussion of each system will involve the historical evolution of each system. The differing points of view each service has about the advantages or disadvantages of each system will also be discussed. Finally, recommendations to refine a system for use in future contingencies will be attempted. The following criteria will be used to evaluate the recommended system: flexibility -- the

ability to shift the main effort, adaptability -- the ability to use the system in any theater, and support of Joint Force Commander's (JFC) intent.

Before starting the discussion, a common reference point regarding terminology is required. There are sometimes significant doctrinal differences between services on exact meanings of terms.

Since this is a tactical monograph, I will define an Army corps as a tactical unit. The corps is the largest tactical unit according to FM 100-5.[1] However, the FM also states that a corps commander may, in certain circumstances, be the Army Component Commander, an operational commander.[2] In this paper, the corps will be operating in a theater with at least one other corps. There will be an Joint Force Land Component Commander (JFLCC) as the operational land forces commander. Therefore, for purposes of this paper, each corps is a tactical unit.

The joint force outlined in this paper is commanded by a JFC. Under him will be a Joint Forces Air Component Commander (JFACC) who will generally command all air assets in theater. Also under the JFC is the JFLCC who commands all land forces in theater. Embarked Marine and surface Navy forces, while essential to joint warfare, are irrelevant to the subject of this paper and will not be discussed.

Two mission terms require definition. They are interdiction and offensive air support. Interdiction is a strike mission whose objective is:

> to delay, disrupt, divert, or destroy an enemy's military potential before it can be brought to bear effectively against friendly forces. These combat operations are performed at such distances from friendly surface forces that detailed integration of specific actions with the fire and movement of friendly forces is normally not required.[3]

While ostensibly a good definition, it leaves room for interpretation. To further define interdiction, I refer to Joint Pub 3-09, Joint Fire Support: "Joint interdiction directly supports the campaign or major operation plan and as such, does not normally require detailed integration and coordination with the surface scheme of maneuver."[4]

In comparison to interdiction, Close Air Support (CAS) and Battlefield Air Interdiction (BAI) fall under the category of joint fire support since they are done in "... support of a particular force and, therefore, require detailed integration and coordination with the scheme of maneuver of the supported force."[5]

The second mission term, offensive air support, is a NATO term. It refers to air support of land forces and entails both CAS and BAI. In fact, NATO believes the two missions to be similar enough to state, "Allocation options should be planned to be interchangeable between CAS and BAI and the option selected will depend upon the tactical objective to be achieved."[6] NATO allocates sorties as OAS. The corps commander is then free to use his allocation as CAS or BAI.

Now provided a common point of terminology, we will discuss the development of our current command and control arrangement.

Evolution of Control Measures for Tactical Airpower

Powered flight is less than one hundred years old. During this limited period, technological capabilities have grown exponentially from powered flight of a few hundred feet at about 30 miles per hour to intercontinental range at several times the speed of sound. However, the command and control of this capability has evolved slowly, accompanied by numerous wrong turns. A review of this evolution will highlight the lessons learned which drive the systems in use today.

During World War I, aircraft had their first sustained use in combat. Initially used for battlefield reconnaissance, they later were armed to shoot down the enemy's aircraft. Thus, the "prime directive" of Air Force doctrine, air superiority, was born.[7] Since air power was still in its infancy, technology limited its close air support capability to bombing and strafing the trenches. This also was the beginning of an Air Force-Army controversy over the best use of tactical airpower.

After the war, two schools of thought arose. The first school recognized air power's ability to support ground maneuver. They wanted to enable the land commander to have greater control over air assets. This group managed to carry the day and their view was incorporated into the Army's Field Manual (FM) 31-35, Air-Ground Operations, used in the beginning of World War II.[8]

The second group, composed of men like Generals Billy Mitchell and Henry A. "Hap" Arnold, believed air power would

eventually have the capability to do more than merely support a ground battle. I agree with the statement that "... their visionary reach exceeded their technological grasp by many decades. As a result, they seemed to promise quick, cheap victories from the air."[9] While the largely irrelevant argument of airpower's capability to win wars still rages today, several supporting arguments had an impact during World War II. These arguments were about application of the principles of mass and unity of command.

During the North Africa Campaign, the Army Air Corps implemented FM 31-35 and provided land commanders with their own air units. The shortcomings of the system contributed to the defeat of the Americans in February, 1943, by "... stripping air power of its flexibility and ability to concentrate its power on the crucial targets within the North Africa Theater."[10] This occurred because:

> Ground commanders jealously guarded their own aircraft allocations, they did not cooperate, and no overall command authority existed to coordinate a theater-wide targeting strategy or to mass sufficient air forces to achieve any notable tactical success. The fragmented command and piecemeal employment of tactical aircraft dissipated American air assets and enabled the Germans to achieve temporary, localized air superiority over the battlefield.[11]

After the campaign, the Army rewrote its air doctrine into FM 100-20, Command and Employment of Air Power. This document established US land and air forces as coequals.[12] It still required the air forces to support the land forces, but required both commanders to integrate their operations into a single

plan. It also recognized the importance of air superiority.[13] This manual is the ancestor of current tactical air doctrine.

During the Korean War, a different doctrinal dispute arose. It involved the argument over who should control air power. This dispute was primarily between the Navy and, the new service, the Air Force. The Air Force believed the principle of unity of command should apply to the interdiction campaign in North Korea. During the first few months of the war, there was little coordination between the services. Some targets were struck more than necessary, while others were left untouched.[14] Eventually, the problem was resolved and a central air commander was established. His responsibility was to plan and control all theater air, including carrier-based.[15]

> With the conclusion of the Korean War, airpower had again demonstrated the need for a command structure that didn't arbitrarily divide forces between mission areas. The command structure had to be capable of using airpower in a variety of tasks simultaneously or in sequence. The fundamental point, though, was that the theater air component commander had to control all the airpower in the theater so that he could support ground, naval, or air operations- wherever the enemy was weak.[16]

This command structure, with its Theater Air Component Commander, was the precursor to the JFACC.

The air supremacy that came by default in South Vietnam allowed the development of the TACS. The system was designed to control CAS in Vietnam and is still in use today. Because there was no air threat in Vietnam, fighters had the time to contact the control centers and be handed off to Forward Air Controllers (FACs). These FACs then had the time to talk the fighter pilot's

eyes onto the target. The result was usually a very effective attack, which provided visible and responsive support to the land commander. On the other hand, the intricacies of attacking a man-power intensive resupply system covered by a jungle canopy made the interdiction effort much less effective.[17] This may have reinforced a perception that CAS is more effective than interdiction.

After Vietnam, TACS continued to evolve and became somewhat theater specific. Each theater has refined the procedures to suit its needs. To understand each theater's procedures, we need to understand the basic system. So, we will now discuss in detail the Tactical Air Control System and its procedures.

The Tactical Air Control System

TACS has evolved from its rather primitive beginnings into a highly automated centralized control system. It is directly responsible to the JFACC and, through him, the JFC. Its principle product is the ATO. Before getting into the intricacies of the ATO, we will discuss the organization of TACS.

The major agencies in the TACS are: the Tactical Air Control Center (TACC), Battlefield Coordination Element (BCE), Air Support Operations Center (ASOC), and Tactical Air Control Parties (TACP). The TACC is the central control organization responsible for tactical air sorties in the theater. There is usually only one TACC in the theater and it serves as the JFACC's staff. Its product is the ATO. The BCE is an Army cell

in the TACC. Its mission is to "articulate Army requirements for air interdiction missions to the JFACC and the TACC staff."[18] With each corps is an ASOC responsible for coordinating CAS missions between the TACC and the corps. A TACP can be assigned at multiple echelons from battalion to corps. The senior officer in it is the Air Liaison Officer (ALO). He is responsible for assisting land commanders to plan tactical air (TACAIR) sorties and coordinating CAS.[19]

With an understanding of the organization and responsibilities each staff has in TACS, we can discuss the process. The JFACC is responsible for two tasks, winning the air battle and supporting all surface forces in theater.[20] In order to accomplish these two tasks, he conducts an analysis much like the Army's METT-T (Mission, Enemy, Terrain, Troops, and Time Available) and decides on his course of action. That course of action is implemented through the apportionment and allocation system.[21]

"Apportionment is the determination and assignment of the total expected effort by percentage and/or priority that should be devoted to the various air operations and/or geographic areas for a given period of time."[22] This determination is made by the JFC based on a recommendation from the JFACC. This recommendation is made in coordination with the Land Component Commander based upon the guidance and priorities of the JFC. Apportionment is done for three missions: counter-air, air interdiction, and close air support and is applicable for a

specified length of time. BAI may also be apportioned depending on the theater and JFC's guidance.[23]

Allocation is the next step in the process. The JFACC will determine the number of sorties available, by aircraft type, during the apportioned period. Availability of aircraft, munitions, air crews and the sortie generation rate are the factors considered. This will give the JFACC the actual number of sorties available for each mission.[24] This number is then given to his staff in the TACC to develop into the ATO.

A subprocess of allocation is distribution. In it, CAS sorties are distributed to the corps ASOC. This distribution is based on the priorities of the JFLCC. The ASOC is then responsible for managing its corps' CAS. CAS is made up of two types of sorties, pre-planned and immediate. The preferred type is pre-planned. This allows for proper planning of munitions. It allows the pilot to study the target and target area. It also allows for integration of the CAS mission with other support assets such as electronic warfare assets.[25] Pre-planned CAS is the ideal; unfortunately, the enemy has an input to war. At times his actions do not allow for pre-planned CAS.

In the case where the enemy's actions preclude pre-planning, immediate CAS is the mission. The sorties for this mission can come from a variety of sources. In general, they are either held under corps' control as CAS alert, or they are diverted while airborne from other missions. There are a number of important things to keep in mind about immediate CAS. First,

while the request travels through Air Force channels to the ASOC, the corps' G-3 Air, FSCOORD, or other designated representative is the final approval or disapproval authority.[26] A second item to remember is that immediate CAS is not immediate. As soon as the ASOC receives the request, it begins to process the request assuming the request will be approved.[27] By operating under this assumption, coordination is done in parallel, resulting in faster response time. If the request is approved, the tasking is sent to the appropriate Wing Operations Center (WOC). The fighters are then scrambled. The response time is now dependent on distance from base to target.

The fastest response time will probably be achieved by diverting airborne fighters. While this does improve response time, it carries two drawbacks. First, the fighter may arrive with the wrong type munitions.[28] If the target is a column of T-72 tanks and the F-16 arrives carrying cluster bombs, the F-16 will have little chance of mission success.

The second drawback to immediate CAS is the original mission of the diverted fighter is not accomplished. While this seems simple, it has ramifications to the brigade whose pre-planned CAS sorties were just diverted by corps. Similarly, if the fighters were originally attacking a second echelon regiment to that brigade's front, the regiment is now untouched. The brigade commander must now adjust his plan in the heat of battle. The point is this, using immediate CAS has its cost. If

the payoff for using it outweighs the cost, then it should be used.

CAS missions are tasked in the ATO with a vulnerable time, which is a time period during which they must be available. The ATO also tasks them with a munitions type, with frequencies to contact control centers, and with a general target location.

When launched on a CAS mission, the flight lead will contact the ASOC for a mission brief. The ASOC will issue clearance into the High Density Airspace Control Zone (HIDACZ)- a large block of airspace in which the fighters will be working. If the FAC or ALO has given the ASOC a mission brief, the ASOC will pass the brief to the fighter. If not, it will have the fighter contact the FAC.

The FAC will direct the fighter to a contact point - a prominent ground feature. This point is used to orient both the FAC and the fighter as to each other's location. At the contact point, the FAC will pass the brief to the fighter. The brief will consist of target, initial point (IP), heading, distance, target altitude, threat, attack restrictions, friendly location, and clearance. Once the fighter lead receives this briefing, he will proceed via his own best judgement from the IP to the target. This route will be fairly direct, but may cross brigade or division boundaries. The ASOC is responsible for ensuring that all concerned understand that the HIDACZ is occupied.

The handling of interdiction and, its subset, BAI differ in many ways from the way CAS is handled in the TACS. The most

prominent difference is that BAI and interdiction are flown in packages with many different types of support aircraft.

For instance, a BAI strike package targeted against a 1980's Soviet style threat might consist of 24 strike aircraft. These aircraft might be supported by 12 F-15 counter-air aircraft, 4 F-4G defense suppression aircraft, 2 EF-111 electronic warfare aircraft, an AWACS command and control aircraft, and 8 KC-135 refueling aircraft. Since these assets are not likely to all come from the same base, synchronization of the rendezvous is critical. This is handled by the planning cell at the TACC and the plan is distributed via the ATO.

The synchronization of planning cycles between the ATO and the corps is crucial. The ATO process begins 72 hours prior to the time it is executed. The first input is the JFC guidance and tentative apportionment. A tentative forecast of BAI availability is sent to the corps by the TACC through the BCE. The corps gives the priority and weight of effort of subordinate units to the BCE. The corps commander decides on the type of targets he will attack with BAI. Air Force and Army intelligence assets then try to locate the targets for BAI sorties.

At the 48 hour remaining mark in the process, the TACC recommends apportionment priority or percentages. Also at this point, the corps has passed its mission order to its subordinate divisions. At the 36 hour point, the JFC makes the apportionment decision final. As the divisions are finishing their orders at the 30 hour point, corps is finalizing its list of interdiction

target nominations and its BAI target list. The interdiction nominations are selected under JFC guidance which differs between theaters but might include a Joint Target Coordination Board (JTCB).

At the 18 hour remaining mark, the TACC publishes the ATO. The individual fighter wings are now responsible for its execution. Meanwhile, the BCE has been continuously updating target locations collected from both Army and Air Force intelligence assets. It continues this updating until two hours prior to the strike package take-off.[29] While certainly an ideal example, the above process demonstrates the BCE is crucial as a coordination and liaison body throughout the ATO process.

Although the process seems foolproof, there are numerous issues that the Army and the Air Force disagree about in the system. The first is suballocation of CAS sorties. This occurs when the corps commander takes his corps' allocation of CAS sorties and divides them among his divisions. The divisions further subdivide them into brigade allocations.[30] The Army's position is that allocating the sorties to the lowest level improves responsiveness and ensures that the sortie will actually support the land commander's scheme of maneuver.

However, the Air Force believes that by ensuring that every brigade gets a CAS allocation, the principle of mass has been violated. For instance, an Army group with a CAS allocation of 200 sorties and 4 corps might suballocate 50 sorties to each corps. If the corps had two divisions and distributed the

sorties equally, we now have 25 sorties at each division. If we divide the allocation further to each division's 3 brigades, we now have 8 sorties for each brigade.

The Air Force's position on CAS subdistribution cannot be explained without discussing the effect of those 8 sorties. A brigade usually has a mission of defeating a division. A USAF Tactical Air Command study estimated that "50 percent of a division's combat vehicles or 300 vehicles must be destroyed to disrupt an army level plan."[31] Historical data has suggested that the tanks killed per sortie ratio is less than 1 to 1.[32] Given this, the 8 sorties of CAS are not likely to do much to support the land commander's scheme of maneuver.

An additional problem surfaces with the distribution of CAS. It fosters a distribution of artillery. Suppression of Enemy Air Defenses (SEAD) is an Army mission to "the limits of observed fire."[33] Since the corps will attempt to synchronize the operation of its maneuver forces, the sorties distributed across the corps are likely to be executed simultaneously. This would mean the artillery support for SEAD must fire at many targets across the frontage of the corps. This will tend to prevent artillery from massing and dilute its effects.

Contrast this with a corps CAS mission in support of the main effort brigade. Fifty sorties in conjunction with a Corps' Combat Aviation Brigade attack and Corps artillery firing a concentrated SEAD mission could have a pronounced effect on the enemy.

An additional problem with TACS surfaced in Desert Storm dealing with battle damage assessment (BDA). Corps commanders nominated interdiction and BAI targets and some of these targets were the same as those nominated by other corps. Since the system did not have a common numbering system, it could not track the fact that a target was nominated by multiple units.

When a nomination came forward it was given one number, subsequent nominations of the same target had their identification number changed to this number. When it was hit, the BDA was passed back to only the first requestor. The requests from other units for attacks on the same targets had been dumped. When those units requested BDA, based on their original request number which no longer existed, BDA was not available. This frustrated the corps commanders, since they felt their targets were not being struck even if they had been.[34]

As this discussion has shown, the TACS has evolved since World War II. The evolution has occurred because of changes in the nature of war and technology. Compromises occurred because of these changes. We will now move on to discuss two theater specific changes to the TACS. The first will be changes in NATO involving OAS.

Command and Control of Tactical Airpower in NATO

The basic structure of the command and control system in NATO is very similar to that used in TACS. This is not surprising given the heavy American presence in the command structure of NATO. However, there are a few significant

differences between the systems. In part, they developed because of the defensive nature of NATO's mission and, partially, because of the difficulty in developing a command structure involving forces from several nations.

NATO's command and control structure has a much wider scope than TACS. The area under SACEUR's command is best described as a theater of war. His principle concern is the strategic level of war. TACS is a theater of operations system. To compare the NATO system to TACS, we must first define a theater of operations in NATO. The theater of war in NATO is broken down into three theaters of operation, Allied Forces Northern Region, (AFNORTH), Allied Forces Central Region (AFCENT), and Allied Forces Southern Region (AFSOUTH). The AFCENT commander is roughly analogous to the JFC in TACS. In this comparison, his JFACC is Commander, Allied Air Forces Central Europe (COMAAFCE).

With an understanding of what level in NATO corresponds to TACS, we can begin to compare the two systems. The most visible difference between the two systems is the nomenclature of the agencies involved. All the functions in the TACS are performed in NATO. However, they may not necessarily be performed at the same level or by a single agency. For instance, the function of the TACC is performed by two agencies in NATO, the Joint Command Operations Center (JCOC) and the Allied Tactical Operations Center (ATOC).

The JCOC is the allied joint operations center at Allied Tactical Air Force (ATAF) responsible for allocating air

resources.[35] It is responsible for planning joint operations, determining air asset availability, allocating air assets to support joint plans, and considering requests for additional OAS.[36] These functions would be performed by the plans cell in the TACC.

The ATOC is the allied air operations cell at the ATAF JCOC.[37] It is responsible for control, direction, and tasking of air operations. Its missions are similar to the remaining missions in the TACC. At the Corps and lower levels, NATO and the TACS agencies are identical in name and function.[38]

NATO and TACS also differ in the apportionment-allocation process. NATO has three significant differences in the process. First, NATO introduces a new term, allotment. Second, the apportionment decision is made at a lower level than the JFC. Third, the allocation decision is made between OAS, interdiction and counter-air sorties.

Allotment is "the temporary change of assignment of tactical air forces between subordinate commands."[39] An example of allotment might be in shifting one ATAF to another's sector in anticipation of an enemy attack in that sector. COMAAFCE has the authority to allot forces in Central Europe.

Apportionment is the same process in NATO as in TACS. However, in TACS, the apportionment decision is made by the JFC upon the recommendation of the JFACC and JFLCC. In NATO, though, the apportionment decision is made by COMAAFCE (in Central

Europe) under the guidance of Commander Allied Forces Central Europe (CINCCENT).[40]

Both NATO and TACS define allocation the same. NATO also recognizes a difference in mission for CAS and BAI; although NATO classifies the two missions together as OAS in the allocation process. In NATO, when the corps commander receives his allocation of OAS sorties, he is free to employ them as CAS or BAI as he sees fit. This gives the corps commander more control of his air support.

Should the corps commander decide to fly his allocation as BAI, the ATAF, through the ATOC, will execute the sorties much the same as the JFACC would through the TACC. The reason for this is BAI sorties will, by definition, be further behind enemy lines. This will require more support from other air assets since the corps SEAD responsibility is only to "observed fire" range. Since support aircraft are not apportioned nor allocated, the corps cannot build the support package. Therefore, the responsibility falls to the ATOC to build and execute the support package.

The difference in control of BAI between NATO and TACS is a source of disagreement between the Army and the Air Force. The issue involves responsiveness from the Army's perspective and timing from the Air Force's. The Army doctrine for deep attack is "decide, detect, deliver."[41] Under this doctrine, the corps commander decides what targets to look for and focuses his collection assets on those targets. This, of course, takes time.

The enemy will attempt to deny or delay detection. If the enemy denies the detection up to the planned time of attack, the aircraft tasked to attack the target must either sit on the ground or attack an alternate target.

The corps commander would prefer to have those aircraft readily available, since he is confident he will eventually detect the target. The air commander would like the aircraft to attack an alternate target, since there are always more targets than available aircraft and an extensive wait on the ground limits the sorties those aircraft can fly each day. Limited sorties translates to limited targets struck. In addition, aircraft on the ground are very vulnerable to ground and air attack.

NATO's handling of BAI as OAS is an attempt to compromise. By giving the corps commander OAS sorties, he has more control over the strike aircraft. However, he does not control the support aircraft. If the detection of the target does not occur in the time the support package is available, then the corps commander must decide if the target is important enough to risk the strike aircraft unsupported or divert them to an alternate target.

The differences between TACS and NATO's system are subtle. Many Army personnel have a great deal of experience in NATO and may make the assumption that procedures in NATO and under TACS are the same. For the most part the procedures are the same. However, there are enough differences in the command and control

area to cause problems if people blindly carry that assumption to other theaters.

Another theater which has differences in procedures is in the Republic of Korea. There, the Combined Forces Command (CFC) recently published its final draft of Deep Battle Synchronization Doctrine. This doctrine outlines its changes to the TACS.

Command and Control of Tactical Airpower in Korea

There are several notable differences between TACS and the command and control system used in Korea. Primarily, these are in the area of deep battle. Differences in other areas are minor in nature and will not be discussed.

The doctrine provides a much more precise definition of deep operations than FM 100-5. Deep operations are:

> Activities directed on objectives not in the immediate vicinity of our main forces, for neutralization, reconnaissance surveillance, and destruction of enemy reserves and weapons, and interfering with enemy command and control, supply, communications, and observations. (Normally operations beyond the DBSL).[42]

The DBSL refers to the Deep Battle Synchronization Line, a "line established by the Commander in Chief, Combined Forced Command (CINCCFC) to synchronize fire of air, ground and sea weapons using any type of ammunition against targets that fall within the theater deep operations area."[43]

The doctrine also specifically assigns responsibility for the execution of deep battle. In the doctrine, the Commander in Chief, Combined Forces Command, "designates the Commander, Air

Component Command, as the commander responsible for the theater deep battle plan."[44] By specifying who is responsible for deep battle and clearly defining those responsibilities, the doctrine eliminates many ambiguities in the conduct of deep battle present in other theaters.

The doctrine also specifies which systems are used in conducting deep battle. These systems include: tactical aircraft, special operations forces, naval gunfire, surface to surface missile systems, artillery, army aviation, and command, control and communications countermeasures.[45] Army aviation assets are considered deep battle assets when operating beyond the DBSL. If conducting an air assault, the doctrine provides for flight deconfliction and synchronization. If they are conducting interdiction operations, then the targeting portion of the doctrine also applies.[46]

The mechanism to make this doctrine work is centered in two objects, the Combined Targeting Board (CTB) and the Integrated Tasking Order (ITO). The CTB is the agency tasked by the Commander, Air Component Command (CACC) to coordinate, deconflict and synchronize the deep battle.[47] Its executive board oversees the process. The board is made up of O-6's from the Air Component Command, Land Component Command, Naval Component Command, US Marine Forces Korea, 7th Fleet, and Unconventional Warfare Task Force. Since the ACC is charged with overall responsibility for deep battle, it chairs the board with an O-7.[48]

The staff for the executive board comes from the Combined Targeting Cell (CTC), which presents a target prioritization recommendation to the board. From this recommendation, the board finalizes a Single Prioritized Integrated Target List (SPITL). From the SPITL, each executive board representative (except those representing air assets) chooses a target. Agencies choose targets in a sequence based on lead time and planning. Once these agencies have exhausted their capacity to attack targets, the remaining targets are assigned to air assets.[49]

The CTC keeps the SPITL current by continuously revalidating targets, updating locations, and carrying forward insufficiently damaged targets to the next periods SPITL.[50]

Once the executive board has assigned targets from the SPITL, the list is passed to a combat planning cell to coordinate details. It is passed back to the CTC for plotting on the master target chart. The CTC also resolves any mission conflicts and additional coordination requirements; then, it publishes the plan as the ITO.[51]

The primary distinction between the ITO and the ATO is the latter only has data for air interdiction sorties supporting the deep battle. The ITO has the entire deep battle plan, including mission details, targets, TOTs (Time on Target), and supporting elements.[52] Had our hapless F-15 pilot at the beginning of the paper been operating under an ITO instead of an ATO, he would have known about the Apache flight and the impending rocket strike.

The advantages to the doctrine are its precise delineation of responsibility for execution of deep operations and its synchronization of all assets capable of conducting deep operations under one commander. It also has the advantage of insuring that all participants in the operation know the other players in the area.

However, like all doctrine, Deep Battle Synchronization Doctrine has some limitations. Chief among these is its limited applicability in larger theaters. The Korean theater is small compared to either a European or Southwest Asian theater. Virtually all deep battle capable assets have the range to strike any target in the Korean theater.

In a larger theater, the commander would have less flexibility in employing his deep battle assets. The longer ranges to targets in a larger theater would tend to subdivide the deep operations area into zones of responsibility. For instance, the Army is limited by their artillery to the first 100 kilometers in front of friendly positions. In Korea, this range allows artillery to attack targets almost to Pyongyang. In Southwest Asia, a significantly lower proportion of the land behind the DBSL could be attacked by artillery. The effect of these de facto zones of responsibility is to limit the commander's ability to mass assets on a deep battle target.

Another limitation of the doctrine's adaptability is caused by the terrain. With the rugged mountains dominating most of the country, as well as the narrow width of the peninsula, the

terrain would not support a fast paced maneuver war similar to Desert Storm. Thus, a slower pace allows time for a more judicious study of the SPITL. In a more fast paced war, this time may not be available. The commander in a different theater could fix the problem somewhat by either setting the DBSL deeper or starting the deep battle before the close battle starts. If the commander has the freedom to start the deep battle early, such as occurred in Desert Storm , the latter option may be better. Setting the DBSL deeper requires the commander to strike more targets with his fire support assets instead of his interdiction assets. However, the combination of a fast paced land war and constraints against early deep operations might force the commander into this situation.

We now have an understanding of TACS and theater specific modifications used in NATO and Korea, as well as some concerns about each of the systems. We will now discuss planned and recommended improvements to TACS that will enable it to handle the operational requirements in the 1990's.

Planned Modifications to TACS

TACS is being modernized to better handle changes in the force structure, to improve equipment, to employ new concepts, and to adjust to a changing battlefield.[53] These changes are being implemented now and center around the TACP and ASOC.

The force structure changes in the Army since the last TACS modernization effort include Combat Aviation Brigades (CAB) and light divisions. The Air Force force structure changes include

the reduction in tactical fighter wings. The result of these changes has been an increased requirement for TACPs by the Army and increased availability of fighter pilots by the Air Force. When modernization is complete, the TACP at corps level will be augmented by two fighter liaison officers. The TACP at division and separate brigade level will gain one fighter liaison officer.[54]

The fighter liaison officer (FLO) is an additional position not meant to assume existing responsibilities. The position is designed to be an Air Force planner to provide "increased TACAIR planning capability to support continuous combat operations at the corps, division, and separate brigade."[55]

In addition to the increased manning at existing TACPs, a TACP will be created for all active duty corps and division CABs. This will be manned by two ALOs and four Tactical Air Control Communication Specialists (TACCS). The two officers and 4 enlisted personnel will be permanently assigned and collocated with their CAB and report to the corps or division ALO. They are responsible for planning and coordinating Joint Air Attack Team (JAAT) missions and joint cross FLOT (Forward Line of Own Troops) operations. They also provide an available TACP should TACAIR operations be required for a corps or division rear battle.[56]

The TACP structure in support of a light division will gain one additional TACCS for additional terminal control capability.[57] This will give each battalion 1 ALO and 3 TACCS.

At the brigade forward command post (CP) will be a FLO and a TACCS while at the brigade main CP will be an ALO and 2 TACCS. The division forward will have a FLO and two TACCS. The division main will have an ALO, a FLO and 2 TACCS.[58]

One goal of this modernization is to have at least fifty percent, and preferably all, of the TACCS trained and qualified as enlisted terminal attack controllers (ETAC). This will, of course, improve combat flexibility of the TACP and its supported unit.[59]

Heavy maneuver units will also have their TACPs restructured. Instead of a by-name alignment of ALOs with a battalion, the alignment will now be at brigade. This creates a TACP pool at the brigade allowing more "efficient use of TACP personnel to support the brigade level fight, allowing more flexible movement to achieve a better battlefield position to control air strikes."[60] The brigade ALO is responsible for dispersing TACPs within the brigade area to provide terminal control of air strikes.

The increased manning at all levels in the TACS gives the system improved responsiveness. A problem with TACS in the past has been passing target updates for BAI missions. With the improvement in near real time information systems, solution to the problem is more critical. Expanding the mission of the ASOC is an attempt to solve the problem. The mission of the ASOC in the past has been to support TACP requests for immediate CAS and reconnaissance and pass them to the TACC. The modernization of

the TACS will expand the ASOC mission to include "final planning and execution adjustments of BAI missions."[61]

Improved near real time information systems under corps control will provide the ASOC the information required to update BAI pilots with target and threat information. This information update should make the BAI mission more efficient. An added benefit of BAI involvement by the ASOC is it should make diversions of BAI sorties to immediate CAS quicker and simpler to coordinate, if required.[62]

ASOC involvement in final adjustment of BAI targeting should not be interpreted as replacing the packaging and coordinating of large strike forces involving cross FLOT operations. That is still the responsibility of the TACC. The attempt is to use the Air Force planners at the corps, division, or separate brigade, who should be more familiar with the unit commander's scheme of maneuver, to make BAI more responsive to changing battlefield conditions.[63]

In addition to expanding the ASOC's mission, the TACS modernization will also relocate it. Currently, the ASOC is located with the TACC in peacetime; during contingencies it deploys and comes under the command of the corps ALO. In the modernization, the ASOC will be permanently located with the corps' Tactical Operation Center and commanded by the ALO. This will encourage training opportunities for joint planning and exercises as well as reduce confusion during the initial stages of a contingency.[64]

To round out the modernization of the TACS, the system will receive extensive equipment upgrades. This will center primarily in automated command and control systems, but will include capability to receive information from the Army All-Source Analysis System (ASAS) and Global Positioning System (GPS).[65]

This brings the evolution of the TACS into the early 1990's. The Army will soon publish its new operational concept, AirLand Operations, which is itself an evolution of AirLand Battle. Will TACS be able to support AirLand Operations? Should it? If it should, but does not, what changes will be required?

AirLand Operations

Before we can discuss how well TACS will support battle under AirLand Operations, we must understand how the Army envisions the battlefield. The new operational concept states that the battlefield will be less linear due to changes in the threat, reduced force levels, and technology. It also says that success will be accomplished less by terrain objectives and more by initiative and clearly defined intent. This develops into a concept called "one extended battlefield."[66]

This extended battlefield may have aspects of linearity in it, but they must be synchronized with nonlinear operations in order to achieve the operational commander's purpose. The doctrine divides the battlefield into six areas: the joint intelligence and air attack area, the joint battle area, the shaping area, the close battle area, the dispersal area and the staging and logistics area.

Some of these areas are self-explanatory.[67] However, a short explanation of some of the areas is required. The joint battle area is "... where Army forces fight to the depth of all their weapons systems and where Army and Air Force capabilities overlap."[68] The shaping area "... must be large enough to locate and develop the enemy situation and establish and initiate the operation plan as well as to provide security."[69] The close battle area is defined as the area the commander chooses to conduct decisive operations.

The exact roles and locations of each area are not fixed. Rather, they are "created and modified by the operational commander as he synchronizes , orchestrates, and harmonizes the many activities that will result in success."[70] In short, the concept specifies a very fluid, malleable battlefield, which the commander may shape to meet his desire.

AirLand Operations also specifies an operational cycle with four stages. The first stage is the detection/preparation stage, which includes intelligence preparation of the battlefield, movement planning, and staging capabilities. The second stage is establishing conditions for decisive operations. This involves isolating selected enemy forces in time and space to create favorable conditions for friendly force employment. This, of course, uses all the long range fire systems as well as political and diplomatic measures. The third stage is to conduct the operation to accomplish the assigned mission. The fourth stage is to prepare for follow on operations.[71]

An important point to remember is that AirLand Operations as a concept is meant to be broad enough to be employed across the operational continuum. However, AirLand Operations is not joint doctrine, it is an Army concept. The problem then becomes how to integrate TACS and AirLand Operations into joint procedures to support the commander's intent.

Analysis

Why not use TACS as is? For that matter, why not use the OAS system or Deep Battle Synchronization? As discussed earlier, each system has limitations in flexibility or adaptability thereby limiting its ability to support the JFC's intent. By combining aspects of each system, the procedures proposed below should increase flexibility and adaptability. The result of the increase in those areas should expand tactical airpower's ability to support the JFC's intent.

The integration of TACS and AirLand Operations hinges on the battle shaping area and the distinction between interdiction and fire support. A restating of the difference between the two missions is required. Interdiction is airpower directed in support of the JFC's operational plan. Fire Support is airpower directed in support of a tactical unit, corps and below.

The proposed joint procedures would use the operational cycle concept from AirLand Operations, but the focus should not be solely on ground operations supported by air and sea. Instead, the focus should be on the campaign plan complemented by air, sea, and ground forces.

During phase 1, the detection/preparation phase, airpower will have three important roles: defensive air support, intelligence gathering, and air transport. The assumption here is that the conflict will not occur in an area where large US forces are already located. Given this situation, airpower, whether carrier-based or deployed from the US, is usually the quickest combat power to arrive on scene.

Defensive air support is not a doctrinal term. I use it in this paper to describe both defensive counter-air and fire support sorties to protect the joint task force and provide combat power to it in its early stages of deployment to the theater.

Intelligence gathering will include reconnaissance and electronic warfare. Systems which will develop the electronic order of battle, crucial to the initial stages of the air support of the campaign, will be used in this role.

The last role airpower will be used for in this stage will be transportation. Commanders must already have a plan for a base of operations prior to the logistics "fire hose" being turned on. Otherwise, the stage is set for a logistic situation where needed parts are in theater, but cannot be found.

The point of this discussion about airpower's role during stage 1 concerns who should control what aspects of airpower at this stage. While there are a myriad of officers in command positions, I will concentrate on three: the JFC, the JFLCC, and the JFACC. All three commanders should initially deploy to the

theater and make their "leader recon." After this, the JFC should make his initial apportionment decision between counter-air and fire support sorties. The percentages devoted to each will be situation dependent. After making his initial assessment, he should return to the US and control the deployment effort. The effort to get the process rolling and headed in the right direction is likely to require an effort only the commander can provide.

Meanwhile, the JFACC should command the deployment and employment of air assets capable of providing the defensive air support. The JFACC, doctrinally, is the commander with the preponderance of air assets capable of conducting the mission. The point is, during this stage, the JFACC is the principle actor with assets to attack the enemy. He should command all assets capable of conducting air strikes on the enemy, whether Army Tactical Missile System (ATACMS) or F-16. He could be Navy, Air Force, Marine, or Army. The TACC would be his vehicle for planning and executing sorties.

The JFLCC, during phase 1, should place his priority in protecting his force as it builds combat power, as well as placing them in the proper location. The ASOC to TACC interface would be the primary means for tactical commander's to convey their requirement for fire support sorties.

The next two stages will have more traditional command and control responsibilities. By the time stage two begins, the joint task force has sufficient strength to defend and sustain

itself. During this stage the priority is, according to the AirLand Operations concept, "... using all means necessary to set the condition for the best use of Army capabilities to achieve desired results." [72] The JFC would most likely amend this statement to " ... use of joint task force capabilities..."

One of the conditions necessary to achieve the desired end result will be air superiority. One of the lessons learned in World War I, and relearned in World War II, is air power cannot support land forces effectively without air superiority.[73] If air power cannot support the land forces without it, then air superiority must be a necessary pre-condition for the use of joint task force capabilities to achieve desired results.

Therefore, during stage two, the JFC's apportionment decision should be primarily between counter-air and interdiction. If air supremacy is gained by default, as in South Vietnam, the priority would be interdiction. If air superiority will require a major effort, as in central Europe, priority would be given to counter-air sorties. In either case, a certain percentage would still be required for fire support to handle contingencies.

The counter-air apportionment will be allocated, planned, and executed by the JFACC through the TACS. Joint fire support apportionment will be allocated to the JFLCC for planning much like OAS sorties are allocated in NATO. The JFLCC would be free to distribute the sorties to his corps commanders as they saw fit. The JFLCC would encourage the corps to use the sorties to

support their main effort rather than distributing them equally to divisions and brigades.

The corps commander would plan his employment of those sorties as CAS or BAI with the help of his ASOC. This plan would include planned integration of corps assets to support the strike. The ASOC would pass the plan for those sorties and their corps support back to the TACC for integration into an ITO.

The TACC would build support packages for the strike sorties as is currently done. Should the timing of detection of the target not coincide with the availability of support aircraft, the BCE and the TACC would make a recommendation to the JFACC to either hold the support aircraft to support the package, fly the strike package with corps support only, or cancel the strike. The decision, with recommendations from the JFLCC, would depend on METT-T.

The TACC, rather than the ASOC, is the proper point for integration of the assets, since it has the command and control equipment as well as the proper scope to control assets throughout the theater. The ASOC, on the other hand, is focused at the corps level and will not know asset availability throughout the theater.

As the JFC determines the joint task force has achieved the proper conditions for decisive operations, the campaign enters stage three. During this stage, the apportionment decision will primarily be between interdiction and fire support. A certain percentage will still be required for counter-air, since the

enemy may acquire additional air capability and the commander should allow for that possibility.[74]

The commander should make the apportionment decision and decide how much airpower should be applied at the operational level to further his campaign plan. He would also decide how much is required at the tactical level, in support of units as fire support. Once he made that decision, the JFACC would make the allocation. Sorties allocated for fire support would be planned and executed exactly as they were during stage two. The allocation for fire support would also establish priorities for use of the assets. For instance, Marine aircraft would primarily be used for fire support of Marine ground units. Similarly, Army attack helicopters would primarily be used as fire support. If a particular mission required the special capabilities of one of these systems, an equitable exchange of systems would be arranged.

Sorties allocated for interdiction would be treated in a similar manner to Deep Battle Synchronization Doctrine. Specifically, any asset with capability to perform the mission would be considered. Marine or Army aviation still available after the fire support allocation would be used for interdiction.

The apportioning of sorties based on their having either an operational or tactical effect inherently improves the proposal's flexibility. The JFC can efficiently change the level of air effort in support for either his operational or tactical

plan during phase two and three. It now falls to the staff to plan and execute the apportioned and allocated sorties. Those procedures will be discussed next.

Targeting of interdiction assets will be handled similarly to the CTB in Korea. The function of the CTB will be performed by the Joint Targeting Coordination Board established in Joint Pub 5-00.2. Joint Task Force Planning Guidance and Procedures.[75] The board should be comprised of representatives from each organization having the capability described above. Targeting would be accomplished in the manner prescribed by Deep Battle Synchronization, with the least flexible asset choosing its target first.

The dispersal of the results of the JTCB would be through an ITO from the TACC. The JFACC, whose headquarters is the TACC, owns the preponderance of interdiction assets. Since the TACC will have the most up to date information on the availability of the majority of assets, the JTCB will be part of the TACC.

So far this proposal is relatively clean and precise, but the discussion now reenters the murky area of the difference between interdiction and fire support. The distinction between the two will be a responsibility of the JFC in his apportionment decision. In general, the guidelines of operational versus tactical impact used in our fire support and interdiction definitions will suffice. If the theater is somewhat linear in nature, the distinction could be made with the battle shaping

area. Inside the shaping area, sorties would generally be fire support and up to the tactical commander to utilize. Outside that area, sorties would generally be interdiction and up to the JFACC to employ. Sorties in this case is a generic term for missions and might include Tactical Land Attack Missile (TLAM) strikes or special operations missions. Army aviation sorties employed outside the shaping area would also be considered interdiction and controlled by the JFACC.

By using the shaping area to delineate between interdiction and fire support, the proposal improves adaptability. Different theaters would have different shaping areas and yield a different apportionment between the two missions.

Since missions will be performed by assets from multiple services, an ITO is required. This will be distributed by the TACC and will include all interdiction missions. In addition, it will include all air assets providing joint fire support inside the battle shaping area.

The combination of flexibility and adaptability in the proposal makes it easier to support the commander's intent. By changing his battle shaping area and/or his apportionment decision, the commander ensures that the interdiction and fire support effort supports his operational intent. In this manner, Army doctrine, using the AirLand Operations concept, and Air Force doctrine, using the Tactical Air Control System, can be integrated to support the Joint Task Force Commander's mission.

Conclusion

This paper has traced the evolution of command and control systems for tactical airpower from its beginning in World War I to the systems in use today. It then described the procedures the Tactical Air Control System and its variants use. Included in that discussion were issues of disagreement in each system. It concluded with an effort to describe how two service concepts, TACS and AirLand Operations, could be made complementary in support of a joint task force mission.

To conclude the paper, I would like to express some thoughts on doctrine in general. The military is facing austere times. In the past, this has meant the individual services tend to engage in "turf wars" as each competes for scarce dollars. The time is long past for service parochialism to cease. Whether airpower can win wars or whether it should merely support the Army are irrelevant questions. Legislation and our history dictate that we will fight jointly. As assets become more scarce, more centralized control of them is required to gain the mass, surprise, and economy of force needed to overcome the reduced numbers.[76] It is the joint task force commander's responsibility to organize his command to provide the most efficient control of his assets.

The commander's responsibility to organize his command is unnecessarily complicated by the American view of airpower which generally falls into two camps. One camp believes that airpower

should be independent. The other believes it should be subordinate to land or sea forces.[77] I believe that both sides are wrong. Airpower should complement war on the land or sea, just as land or sea warfare should complement war in the air. There are times when a mission will require airpower to be controlled by a land commander. It may also be true that land forces might be controlled by an air commander. Americans have normally believed the former and only rarely the latter.

In justifying their refusal to believe that land power might need to be subordinate to air, opponents of the view usually refer to history for proof. However, as Neville Brown said in The Future of Air Power:

> Air warfare is a field in which analysis depend on judgements about a variety of factors which change subtly over time and from place to place. So predictive studies of it must not be shackled to the putative 'lessons of history', yet neither can they disregard historical experience. Perhaps the most basic truth to emerge from the past is that it is never possible neatly to distinguish between airpower and other modes of military force.[78]

This should not mean there are no lessons to learn from past events. As General O.P. Weyland, the Commander of the Far East Air Force, is reputed to have said regarding the debacle in the early stages of the Korean War, "What had been remembered from World War II, hadn't been written down, or if written down, hadn't been passed around or if passed around, hadn't been read or understood."[79] Our mission is to avoid this.

GLOSSARY

ALO	- Air Liaison Officer
ASAS	- Army All-Source Analysis System
ASOC	- Air Support Operations Center
ATACMS	- Army Tactical Missile System
ATO	- Air Tasking Order
ATOC	- Allied Tactical Operations Center
BAI	- Battlefield Air Interdiction
BCE	- Battlefield Coordination Element
BDA	- Battle Damage Assessment
CAB	- Combat Aviation Brigade
CACC	- Commander, Air Component Command
CAS	- Close Air Support
CFC	- Combined Forces Command
CINCCENT	- Commander, Allied Forces Central Europe
CINCCFC	- Commander in Chief, Combined Forces Command
COMAFCE	- Commander, Allied Air Forces Central Europe
CP	- Command Post
CTB	- Combined Targeting Board
CTC	- Combined Targeting Cell
DBSL	- Deep Battle Synchronization line
ETAC	- Enlisted Terminal Attack Controllers
FAC	- Forward Air Controller
FLO	- Fighter Liaison Officer
FM	- Field Manual
FSCL	- Fire Support Coordination Line
GPS	- Global Positioning System
HIDACZ	- High Density Airspace Control Zone
IP	- Initial Point
ITO	- Integrated Tasking Order
JAAT	- Joint Air Attack Team
JCOC	- Joint Combat Operations Center
JFACC	- Joint Forces Air Component Commander
JFC	- Joint Forces Commander
JFLCC	- Joint Forces Land Component Commander
JTCB	- Joint Target Coordination Board
OAS	- Offensive Air Support
SEAD	- Suppression of Enemy Air Defenses
SPITL	- Single Prioritized Integrated Target List
TACC	- Tactical Air Control Center
TACCS	- Tactical Air Control Communications Specialist
TACP	- Tactical Air Control Party
TACS	- Tactical Air Control System
TLAM	- Tactical Land Attack Missile
WOC	- Wing Operations Center

ENDNOTES

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